

CLAIMS

1. An electrode group for a battery comprising a positive electrode and a negative electrode wound into a spiral with a separator interposed therebetween, wherein said positive electrode includes a positive electrode current collector and positive electrode material mixture layers formed on both sides of said positive electrode current collector,

said negative electrode includes a negative electrode current collector and negative electrode material mixture layers formed on both sides of said negative electrode current collector, and

at least one of step portions having difference in level formed in said electrode group by lengthwise ends of said positive electrode, said negative electrode and said separator, respectively, is covered with an insulating member arranged on an inner circumference side or an outer circumference side of a turn of said electrode group.

2. The electrode group in accordance with claim 1, wherein one of said positive electrode and said negative electrode serving as the outermost turn of said electrode group has: a double side exposed current collector part ranging from the lengthwise end thereof to a predetermined position inside along the winding direction, on both sides of which the positive or negative electrode material mixture layer is not formed; and a single side exposed current

collector part continued from said double side exposed current collector part to a predetermined position far inside along the winding direction, only on an inner circumference side of which the positive or negative electrode material mixture layer is formed, said double side exposed current collector part and said single side exposed current collector part opposing at least partially to each other without the interposition of the other of said positive electrode and said negative electrode which does not serve as said outermost turn.

3. An electrode group for a battery comprising a positive electrode and a negative electrode wound into a spiral with a separator interposed therebetween, wherein

said positive electrode includes a positive electrode current collector and positive electrode material mixture layers formed on both sides of said positive electrode current collector,

said negative electrode includes a negative electrode current collector and negative electrode material mixture layers formed on both sides of said negative electrode current collector, and

a lead is connected to at least one of said positive electrode current collector and said negative electrode current collector and at least one of step portions having difference in level formed in said electrode group by the periphery of said lead is covered with an insulating member arranged on an inner circumference side or an outer

circumference side of a turn of said electrode group.

4. The electrode group in accordance with claim 3, wherein one of said positive electrode and said negative electrode serving as the outermost turn of said electrode group has: a double side exposed current collector part ranging from the lengthwise end thereof to a predetermined position inside along the winding direction, on both sides of which the positive or negative electrode material mixture layer is not formed; and a single side exposed current collector part continued from said double side exposed current collector part to a predetermined position far inside along the winding direction, only on an inner side of which the positive or negative electrode material mixture layer is formed, said double side exposed current collector part and said single side exposed current collector part opposing at least partially to each other without the interposition of the other of said positive electrode and said negative electrode which does not serve as said outermost turn, and said lead being connected to said double side exposed current collector part or said single side exposed current collector part.

5. The electrode group in accordance with claim 1 or 3, wherein said insulating member is adhered to a position opposing to said at least one of step portions having difference in level.

6. A non-aqueous electrolyte secondary battery comprising a spiral electrode group formed by winding a

positive electrode, a negative electrode and a separator interposed therebetween, a non-aqueous electrolyte and a battery case for housing said electrode group and said non-aqueous electrolyte, wherein

said positive electrode includes a positive electrode current collector and positive electrode material mixture layers formed on both sides of said positive electrode current collector,

said negative electrode includes a negative electrode current collector and negative electrode material mixture layers formed on both sides of said negative electrode current collector, and

at least one of step portions having difference in level formed in said electrode group by lengthwise ends of said positive electrode, said negative electrode and said separator, respectively, is covered with an insulating member arranged on an inner circumference side or an outer circumference side of a turn of said electrode group.

7. A non-aqueous electrolyte secondary battery comprising a spiral electrode group formed by winding a positive electrode, a negative electrode and a separator interposed therebetween, a non-aqueous electrolyte and a battery case for housing said electrode group and said non-aqueous electrolyte, wherein

said positive electrode includes a positive electrode current collector and positive electrode material

mixture layers formed on both sides of said positive electrode current collector,

said negative electrode includes a negative electrode current collector and negative electrode material mixture layers formed on both sides of said negative electrode current collector, and

a lead is connected to at least one of said positive electrode current collector and said negative electrode current collector and at least one of step portions having difference in level formed in said electrode group by the periphery of said lead is covered with an insulating member arranged on an inner circumference side or an outer circumference side of a turn of said electrode group.